

# HEALTH IMPACT ASSESSMENT OF A CADMIUM, ARSENIC AND LEAD SOIL POLLUTION, CASSIOPEE STUDY, AVEYRON, FRANCE

**Nicolas SAUTHIER**, Regional office of the French institute for public health surveillance (Cire) Midi-Pyrénées, Toulouse, France

**Cécile DURAND**, Cire Midi-Pyrénées, Toulouse, France

**Valérie SCHWOEBEL**, Cire Midi-Pyrénées, Toulouse, France

**Frédéric DOR**, French institute for public health surveillance (InVS), Saint-Maurice, France

## Background and Aims

Important pollution was observed in Viviez (south-west of France) due to 150 years of smelting activity. Median concentration in surface soil of private gardens was respectively 20, 3 and 5 times higher than the reference value for cadmium, arsenic, and lead. Maximum cadmium concentrations in locally-homegrown vegetables reached 11 times the European regulation value. Thus, a global public health assessment was carried out in order to estimate the health impact of this pollution and to formulate recommendations.

## Methods

Data from a regional register of renal insufficiencies and national data on causes of deaths were analysed to describe geographical variations in incidence or mortality. A screening for lead poisoning was proposed to children and pregnant women of Viviez. A measurement of urinary cadmium was proposed to all inhabitants in order to estimate the proportion exceeding a medical threshold. Finally, an exposure study to cadmium and arsenic was carried out in order to better understand residents' exposure.

## Results

As compared with other parts of the district, no excess incidence of renal insufficiencies was observed in Viviez, but excess of mortality due to renal diseases particularly in the oldest periods. No case of lead poisoning was identified among 14 participants. Among 596 adult residents, 5% exceeded  $2\mu\text{g}$  of cadmium/g.creatinine and 23%  $1\mu\text{g/g.creatinine}$ : they were recommended to consult their doctor. These proportions were higher than those observed in an unexposed population (4% and 0%). Results of the exposure study suggested the influence of environmental factors such as ingestion of local food and inhalation or ingestion of polluted dust and soils.

## Conclusions

Results of this assessment establish the health impact of the soil pollution among the residents of Viviez. This warrants to propose medical follow-up for the exposed population, and to limit further exposure by implementing soil treatment of private gardens, stopping the consumption of locally-homegrown products and adopting hygiene precautions.